

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
18 December 2003 (18.12.2003)

PCT

(10) International Publication Number  
**WO 2003/105247 A3**

(51) International Patent Classification<sup>7</sup>: **H01L 41/24**

(21) International Application Number:  
**PCT/GB2003/002461**

(22) International Filing Date: 6 June 2003 (06.06.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
0213006.0 6 June 2002 (06.06.2002) GB

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(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,

CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

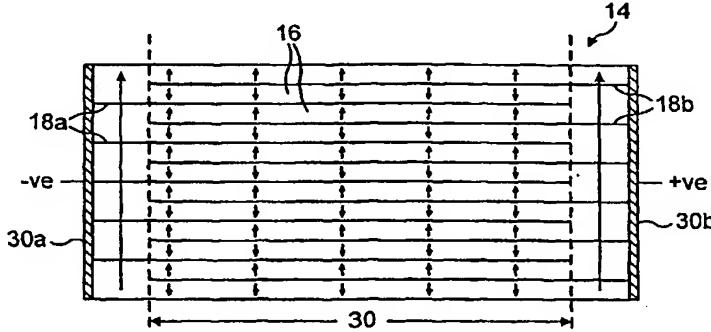
**Published:**

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:  
**13 May 2004**

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: **METHOD OF POLING FERROELECTRIC MATERIALS**



(57) **Abstract:** A method of poling a ferroelectric sample (14) of the type suitable for use in an actuator for an injection arrangement comprises the steps of providing a sample of ferroelectric material having first and second opposing end faces (23), first and second opposing side faces (21), and a stack of ferroelectric layers (16), wherein adjacent layers are separated from one another by internal electrodes (18a, 18b) arranged substantially parallel to the end faces (23) of the sample (14), and applying a primary external electrode arrangement (24a, 24b) to the first and second end faces (23) of the sample (14). A primary poling voltage is applied to the primary electrode arrangement (24a, 24b) so as to polarise substantially the entire ferroelectric sample along a single, first polarisation axis in a first polarisation direction. A secondary external electrode arrangement (30a, 30b) is applied to the side faces (21) of the sample (14), and a secondary poling voltage is applied to the secondary external electrode arrangement (30a, 30b) so as to polarise alternate ones of the ferroelectric layers (16) within those regions of the sample located between internal electrodes of opposite polarity. Alternate ones of the ferroelectric layers are polarised along substantially the first polarisation axis in the first polarisation direction and the others of the ferroelectric layers are polarised along a second, oppositely directed polarisation axis. The method provides a way of polarising substantially the entire sample whilst substantially avoiding discontinuities in ferroelectric strain throughout the sample (14), and particularly those regions adjacent to the side faces (21).

WO 2003/105247 A3